

FACULTY OF COMPUTER APPLICATIONS

Programme Project Report

Bachelor of Science (Information Technology)

3 Years

(Online Mode)



MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH & STUDIES

(Deemed to be University under section 3 of the UGC Act 1956)

1. Program's mission & objectives

➤ **Mission Statement**

1. To develop an online teaching-learning platform for knowledge delivery and skills set generation in the field of Computer Science.
2. To develop analytical thinking and innovative ideation in coming generations.
3. To carry out collaborative multi-disciplinary approach for project development activities.
4. To foster a habit to explore and adaptive mind for new techniques, tools and smart industrial technologies.
5. To create skilled and job-ready, socially-responsible and ethical human resource.
6. To establish entrepreneurs creating huge International level job market and increasing the scope for patentability.

➤ **Program Objectives**

1. A thorough understanding of the core concepts fundamental to the discipline of Computer Science
2. A broad general education assuring an adequate foundation in mathematics and science relevant to Computer Science.
3. Good analytical, design and implementation skills required to formulate and solve problems in multi-disciplinary environment for project based activities.
4. Ability to work as a team and communicate effectively as ethically socially responsible professionals.
5. Foster the ability of lifelong learning to constantly adapt to emerging technologies.
6. A strong mind-set towards becoming an entrepreneur and job creation.

2. Relevance of the program with HEI's Mission and Goals:

• **Institutional Mission**

1. To provide an environment in which teachers love to facilitate and students love to learn, consisting of infrastructure facilities at par with the best institutions in India and abroad.
2. To inculcate skills and impart knowledge to the ignited minds in the fields of science & technology and soft skills including leadership, team-building and communication.
3. To create human beings with golden heart, who work and dedicate themselves for the advancement of humanity.
4. To undertake research and development activities in collaboration with the world of work leading to creation of new knowledge in the fields of science, commerce, humanities, engineering & technology, management, health sciences & therapies, sports, multi-media, applied & performing arts.

- **Institutional Goals**

MREI is dedicated and committed to train and equip its students with the latest knowledge and skills in the chosen fields in the backdrop of Indian ethos and values to enable them to face any global challenge with a view to transforming them into insightful, honourable and responsible citizens of this great country; and imbibe a work culture of theoretical and applied research leading to creation and dissemination of knowledge.

MRIIRS strives continuously to improve quality of education to nurture the talent of our students to enable them to embark upon a successful career. Our team endeavours to achieve this objective through a proper blend of high conceptual and practical skills supported by excellent infrastructure, teaching methodology and commitment to Quality Management.

- **Linkage with Program Mission**

The undergraduate program in Information technology will:

1. Ensure students to acquire the requisite technical, soft and human skills to requisite level in the area of Information technology
2. Allow them to pursue careers in emerging technologies in IT industry/ consultancy/software development/data scientist and allied areas related to Information technology.
3. To comprehend, explore and build up computer programs in the application domains of Artificial Intelligence & Machine Learning, Data Science and Big Data Analytics and software development in Full Stack.

3. Nature of prospective target group of learners

All working professionals, populace from even remotest corner of the country, housewives, under privileged and physically challenged who have successfully completed Senior secondary examination conducted by any government regulated body in any stream with Mathematics is target group of learners for the program. Apart from this, students who have successfully completed diploma in any Engineering stream with Mathematics at 10+2 level can also apply.

4. Appropriateness of program to be conducted Online Mode to acquire specific skills and competence:

The B.Sc. (IT) program offered at MRIIRS by Department of Computer Applications comprises of theory classes, computer labs, self-learning component, assignments, tutorials, project work (software based) and evaluations.

All the components of the program including theory class, computer lab shall be conducted in online mode. The self-learning component is required to be covered by a student with the help of the provided online material and recommended reference books.

Some of the courses of B.Sc. are already available on various MOOC platforms including SWAYAM. However, the institution will develop its own online learning modules which will include the systematic provisioning of assignment and evaluation under Quality Assurance Cell of the University.

5. Instructional Design:

- **Curriculum Design/Study Scheme:**

The duration of the BSc (IT) programme will be three years divided into six semesters.

	Course Type	Course Code	Title of Course	Credits
Semester1	Domain Specific	OBSCIT-DS-101	Linear Algebra & Statistical Techniques	4
	Domain Specific	OBSCIT-DS-102	Programming and Problem Solving Using C	3
	Domain Specific	OBSCIT-DS-103	Operating System	3
	Domain Specific	OBSCIT-DS-152	Programming in C Lab	2
	University Core	OBT-UC-161	Environmental Studies & Waste Management	3
Total Credits				15

	Course Type	Course Code	Title of Course	Credits
Semester2	Domain Specific	OBSCIT-DS-201	Data Structure & Algorithm	3
	Domain Specific	OBSCIT-DS-202	Python Programming	3
	Domain Specific	OBSCIT-DS-203	Data Base Management System	3
	Domain Specific	OBSCIT-DS-251	Data Structure and Algorithm lab	2
	Domain Specific	OBSCIT-DS-252	Python Programming Lab	2
	Domain Specific	OBSCIT-DS-253	Database Management System lab	2
	University Core	OBBA-UC-162	Business Communication	3
Total Credits				18

	Course Type	Course Code	Title of Course	Credits	
Semester3	Domain Specific	OBSCIT-DS-301	Object Oriented Programming using Java	3	
	Domain Specific	OBSCIT-DS-302	Computer Networks	3	
	Domain Specific	OBSCIT-DS-303	Computer Architecture & Organization	3	
	Domain Specific	OBSCIT-DS-304	Artificial Intelligence	3	
	Domain Specific	OBSCIT-DS-351	Object Oriented Programming using Java Lab	2	
	Specialisation: Artificial Intelligence and Machine Learning				
	Domain Specific	OBSCIT-DS-305	Introduction to Machine Learning	3	
	Specialisation: Big Data Analytics and Data Science				
	Domain Specific	OBSCIT-DS-306	Data warehousing and Data Mining	3	
	Specialisation: Full Stack Development				
	Domain Specific	OBSCIT-DS-307	Web Application Development	3	
Total Credits			17		

	Course Type	Course Code	Title of Course	Credits	
Semester4	Domain Specific	OBSCIT-DS-401	Software Engineering	3	
	Domain Specific	OBSCIT-DS-402	Advanced Computer Networks	3	
	Domain Specific	OBSCIT-DS-403	RDBMS using Oracle	3	
	Domain Specific	OBSCIT-DS-453	RDBMS using Oracle lab	2	
	Specialisation: Artificial Intelligence and Machine Learning				
	Domain Specific	OBSCIT-DS-404	Advanced Machine Learning	3	
	Specialisation: Big Data Analytics and Data Science				
	Domain Specific	OBSCIT-DS-405	Introduction to Big Data	3	
	Specialisation: Full Stack Development				
	Domain Specific	OBSCIT-DS-406	Android Application Development	3	
	Total Credits			14	

	Course Type	Course Code	Title of Course	Credits	
Semester 5	Domain Specific	OBSCIT-DS-501	Cyber Security	3	
	Domain Specific	OBSCIT-DS-502	.Net Programming using C#	3	
	Domain Specific	OBSCIT-DS-552	.Net Programming using C# Lab	2	
	Specialisation: Artificial Intelligence and Machine Learning				
	Domain Specific	OBSCIT-DS-503	Deep Learning for Computer Vision	3	
	Domain Specific	OBSCIT-DS-504	Internet of Things	3	
	Specialisation: Big Data Analytics and Data Science				
	Domain Specific	OBSCIT-DS-505	No SQL Databases	3	
	Domain Specific	OBSCIT-DS-506	Big Data Technologies	3	
	Specialisation: Full Stack Development				
	Domain Specific	OBSCIT-DS-507	RPA	3	
	Domain Specific	OBSCIT-DS-508	Node Js Programming	3	
	Total Credits				14

	Course Type	Course Code	Title of Course	Credits	
Semester 6	Domain Specific	OBSCIT-DS-601	Basics of MIS and ERP	3	
	Domain Specific	OBSCIT-DS-608	Project	4	
	Specialisation: Artificial Intelligence and Machine Learning				
	Domain Specific	OBSCIT-DS-602	Introduction to Robotics	3	
	Domain Specific	OBSCIT-DS-603	Natural Language Processing	3	
	Specialisation: Big Data Analytics and Data Science				
	Domain Specific	OBSCIT-DS-604	Data Analytics using Sqoop	3	
	Domain Specific	OBSCIT-DS-605	Introduction to Hive	3	
Specialisation: Full Stack Development					
Domain Specific	OBSCIT-DS-606	Cloud Computing and Virtualization	3		
Domain Specific	OBSCIT-DS-607	Advanced RPA	3		
Total Credits				13	
Total Credits				91	
<i>Beside the mentioned Domain Specific Courses, other University Core, University elective ,Inter-disciplinary, Generic, on-line Courses (MOOCs etc) and other approved courses shall be offered, which shall be notified well before start of the semester. The student shall be required and allowed to opt the courses out of offered courses as per maximum limit for maximum credits and for the category of</i>				29	

<i>Elective Courses under University Rules.</i>	
Total Credits	120

- For Successful completion of BSc IT degree, the student shall be required to earn minimum 120 credits in total, out of which he/she needs to earn 90 credits of compulsory courses through online classes as tabulated above and at least 30 additional credits through University Core/University Electives as approved by the Academic Council of the University.
- A semester typically will have 5-8 lectures (Hrs)/week and 10-16 hrs of interaction/mentoring session/week. It can be conducted on daily basis five days a week, early morning hours and / or weekend depending on the count of the students and their preferences.
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- The E-Learning Material shall have the four quadrant approach; as per UGC (Credit Framework for online learning courses through SWAYAM) Regulations, 2016 taking into consideration the following, namely:-
 - o Quadrant-I is e-Tutorial; which shall contain: Video and Audio Content in an organized form, Animation, Simulations, Video Demonstrations, Virtual Labs, etc, along with the transcription of the video.
 - o Quadrant-II is e-Content; which shall contain; self instructional material, e-Books, illustrations, case studies, presentations etc, and also contain Web Resources such as further references, Related Links, Open source Content on Internet, Video, Case Studies, books including e-books, research papers and journals, Anecdotal information, Historical development of the subject, Articles, etc.
 - o Quadrant-III is the Discussion forum for raising of doubts and clarifying them on a near real time basis by the Course Coordinator or his team.
 - o Quadrant-IV is Assessment, which shall contain; Problems and Solutions, which could be in the form of Multiple Choice Questions, Fill in the blanks, Matching Questions, Short Answer Questions, Long Answer Questions, Quizzes, Assignments and solutions, Discussion forum topics and setting up the FAQs, Clarifications on general misconceptions.
- The students who will participate in at least 75% of the activities (online class + time bound assignments + discussion forms for a subject will be eligible for end semester examination for that course

- **Process of program & Course Approval**

The draft curriculum of the program is prepared keeping in view its relevance to the global, national, regional and local needs by taking the feedbacks from the stakeholders (Parents, Faculty Students, Alumni and Employer) and is then deliberated very meticulously by BOS. It also checks and defines the feasibility, credit hours and scheme of examination. The final recommendations of BOS are further discussed and reviewed in BOF. The recommended program curriculum is then submitted to Academic Council of the University for its Final Approval. On these lines the first year e-contents in the four quadrants will be prepared at least one month before the start of the session. The revision in course contents (addition/deletion), introduction of any new area specific or value-added courses are taken up with the robust mechanism of feedback on curricula prevailing in the university.

- **Faculty & Support staff**

The required number of competent and domain specific faculty (Professor, Associate Professor, and Assistant Professor) is already available in the department and shall be allocated as per the requirements stipulated in the UGC Regulations & Guidelines for Online program. Furthermore, the adequate IT Technical staff are deployed for conduct of Virtual labs and managing the IT

Infrastructure. Also, administrative staff is available at the department and Institute level for the management of EMS, student records etc.

- **Identification of Media**

The required media to be used for the programme for online delivery of its stipulated courses have already been identified with the proportion as stated below:

Media to be used for curriculum	Percentage
Audio/Video material	10%
Work related exercises practical/Quizzes and Assignments	37%
Digital contents	33%
Virtual Labs	20%

- **Student Support Services System:**

For the successful implementation and execution of the program, one program coordinator at the level of Professor shall be designated. The designated Program Coordinator at the end of program for a batch of students shall see the overall attainments of expected Program Outcomes to take further necessary corrective measures and actions for its continuous improvement.

In addition to Program Coordinator, for proper planning, execution and regular monitoring of the course content delivery of each course, one Course Coordinator shall be designated, who at the end

of completion and examinations of the course, shall see the course attainment level of the students register for that particular course. In addition to the Program and course coordinators, there will be a course mentor (as per UGC guidelines), for providing the academic support to the learners and also for managing the teacher-learner interaction groups. For immediate /addressing to the day to day queries/doubts of the enrolled students, course mentors shall be designated/ appointed for each course.

A transparent and robust feedback mechanism from all stake holders shall be put in place as per the prevalent practice for the normal programmes being offered in the University.

The queries/concerns/issues/grievance shared by the learner/student will have a time bound resolution mechanism. In case the course mentor is not able to handle/resolve the issues, it will be escalated to course coordinator, then to program coordinator and in the last to the Director level. The learner will be informed about the status of his concern through a transparent online Redressal mechanism.

6. Procedure for admissions, curriculum transaction and evaluation

- **Eligibility Criteria**

Pass in 10+2 examination with at least 50% marks in aggregate in 5 subjects with Mathematics at 10+2 level.

- **Fee Structure**

Rs 2,50,000/- for three years to be paid in three instalments.

First year: Rs 95000

(Rs 25,000/-(onetime non- refundable registration fees) + 70000/-)

Second Year: Rs 70000/-

Third Year: Rs 70000/-

- Examination fees + IT Resources @Rs. 5000/- p.a. =Rs 15000

Scholarship Policy

I. Policy

a. On Merit Basis

80 % and above marks / CGPA in Qualifying exam will be awarded 100 % tuition fee waiver

70% to 79.99% marks / CGPA in Qualifying exam will be awarded 50% tuition fee waiver

60% to 69.99% marks / CGPA in Qualifying exam will be awarded 25% tuition fee waiver

b. Under Special Category

Categories	Fee Concession	Documents to be Submitted	Continuation
Empowering Women (For women on Sabbatical)	25% on Tuition Fee	Self Declaration	For all Years
Alumni Special(MREI Alums)	25% on Tuition Fee	Certificate/Degree Having Student enrollment no.	For all Years
Government Special(Working with State Govt. or Central Govt.)	25% on Tuition Fee	ID Proof having Employee no.	For all Years
Sports(State Level & above)	25% on Tuition Fee	State Level or National Level Certificate	For all Years
Divyang	25% on Tuition Fee	Disability Certificate	For all Years

II. Conditions for Continuation of Scholarship Policy

Maintain a minimum CGPA of 6.5 Annually (Ist& 2nd Semester).However, if any student considered for fee concession in the first year fails in any of the subject, he/she may be considered for continuation of fee concession provided that he/she shall have to clear the subjects in the subsequent academic year failing which he/she may be not be considered for the continuation of Fee Concession.

➤ Web Based Tools to be Adopted

Our university has adopted a Web based Portal (iCloud EMS) which shall allow the student access to the following:

- Admission & Enrolment Details
 - Fee Details and Online Fee Payment Gateway
 - Prospectus, Regulations & Syllabus
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- Notifications (Admissions, fees, examinations etc.)
 - Lesson Plan
 - Continuous Assessments /Assignments
 - Online PCP Classroom Lectures (Recorded or via Virtual Classroom session) as conducted each semester.
 - Online Copy of the Grade sheet.

A Personal Contact program shall be scheduled, to allow students to attend classroom lectures at the Campus, for a suitable duration of time. The same may also be recorded and uploaded on the web portal, to allow for revision / revisiting. Students may also be provided the facility of live web streaming of the PCP.

➤ **Activity Planner (for one semester)**

S.No	Name of the Activity	Semester 1	
1.	Course Registration and start of classes	1 st day of Session	
2.	Conduct of the first sessional tests T1(from first half of the syllabus)	49 th day	54 th day
3.	Uploading of the result on the web portal	61 th day	
4.	Conduct of the second Sessional tests T2 (from second half of the syllabus)	112 th Day	117 th day
5	Uploading of the result on the web portal	124 th day	
6.	Conduction of the end semester practical exams	131 th day	137 th day
7.	Conduction of the end semester theory exams	147 th day	151 th day
8.	Upload the complete result on ERP/website	162 th day	
9.	Next semester academic calendar	166 th day	

➤ **Evaluation Policy(Grading System)**

➤ **MANAV RACHNA INTERNATIONAL INSTITUTE OF RESEARCH & STUDIES
(DEEMED TO BE UNIVERSITY)**

➤ **Centre of Online Education**

➤ **Examination Policy**

➤

➤ The evaluation will include two types of assessments;

➤ (i) Continuous or formative assessments (in the form of end semester examination or term examination. Weightage of assessments are as follows:

➤ For continuous or formative assessment (in semester): Maximum 30 percent. The categorization for the same is:

➤ MCQs 30%

➤ Subjective (Short/Long) 40%

➤ Discussion/Presentation 15%

➤ Projects/Group Activities etc 15%

➤

➤ (ii) For summative assessment (end semester examination or term end examination):

➤

➤ Minimum: 70 percent. Categorization for the same is:

➤ Objective Type Questions: 30%

➤ Short/Long Questions: 70%

➤

➤

➤ **Passing Criteria in Internal Assessment/ Continuous Evaluation and External/ End Semester Evaluation:**

- Student will be declared pass in the subject if he/she scores jointly 40% marks in Internal Assessment / Continuous Evaluation and External/ End Semester Evaluation.
- Marks or grades obtained in continuous assessment and end semester examinations or term end examinations shall be shown separately in the grade card.
- **Grading System :**

Grade	Grade Point (GP)	Description of performance	Recommended range of marks in percent	Expected number of students in a Grade
O	10	Outstanding	95 – 100	0
A+	9	Excellent	85 – 94.9	Not > 10%
A	8	Very Good	75 – 84.9	Not > 15%
B+	7	Good	65 – 74.9	Not > 15%
B	6	Above Average	55 - 64.9	Not > 40%
C	5	Average	45 – 54.9	Not > 10%
P	4	Pass	40 - 44.9	Not > 10%
F	0	Fail	0-39.9	Not > 10%
AB	0	Absent		0
AP		Audit Pass		0

7. Requirement of Library Resources

The library services at Manav Rachna can be accessed using the

Link <https://manavrachna.edu.in/international-institute-of-research-and-studies/central-library/>

It offers a range of services for academic and research pursuits:

- Circulation Services
- Reference & Research Services
- Digital Library
- Current Awareness Service
- User Orientation Programs
- Wi-Fi and Internet
- Photocopy, Scanning and Printing Facilities

8. Cost estimate of the program and the provisions

Budget for Audio/Video Production, LMS and other requirements:

- Bandwidth- 200 Mbps for one year
 - 240000/- per year (Rs 1000 per year)
 - Cloud Account AWS- Rs. 10,000 – 15,000/- per year
 - Virtual Machine- Rs. 1500/- month per virtual machine

9. Quality assurance mechanism and expected program outcomes

The IQAC is striving to bring newer initiatives pertaining to research, campus development, ICT adoption in teaching scholars through workshops, coordinating Academic and Administrative Audit of the University, etc. At the end of every academic year, the University conducts assessment of the curriculum/ course/ academic programme by students. The 5 assessment focuses on broad areas like reasons for selecting courses,

- 1) Facilities available in the Departments,
- 2) Quality of the syllabus,
- 3) Internal assessment evaluation,
- 4) Quality of the teacher in terms of regularity to classes, command over language, encouragement of students in the classes, completion of syllabus.

Towards the Quality Assurance Mechanism for online distance Programs, the University shall establish a **Centre for Internal Quality Assurance (CIQA)**. The CIQA will be required to

1. Conduct training and capacity building of teaching and administrative staff.
2. To work closely with the CIQA to develop Feedback mechanisms, to allow for Program and Process Review on a regular basis. 360 Degree feedback, from Students, Faculty and Alumni shall be processed, and suggestions and improvements incorporated accordingly.
3. The Course shall be benchmarked with the Courses conducted in campus, for online students/learners, in order to ascertain the quality. These indicators shall be used to constantly improve upon the programs, and make them at par industry standards and expectations.
4. Coordinate with third party auditing bodies for quality audit of programme(s)
5. Prepare and submit and annual report

Expected Program Outcomes and Program Specific Outcomes

BSc (IT) pass out student is expected to have following attributes which are indicative of their ability and competence to work as an IT professional after completion. Program Outcomes of BSc (IT) program are as follows:

PO1. Computational Knowledge: Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.

PO2. Problem Analysis: Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.

PO3. Design / Development of Solutions: Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies.

PO4. Conduct Investigations of Complex Computing Problems: Ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO5. Ability to select modern computing tools, skills and techniques necessary for innovative software solutions

PO6. Professional Ethics: Ability to apply and commit professional ethics and cyber regulations in a global economic environment.

PO7. Life-long Learning: Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

PO8. Project Management: Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.

PO9. Communication Efficacy: Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.

PO10. Societal & Environmental Concern: Ability to recognize economical, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.

PO11. Individual & Team Work: Ability to work as a member or leader in diverse teams in multidisciplinary environment.

PO12. Innovation and Entrepreneurship: Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1. Explore technical comprehension in varied areas of Information Technology and experience a conducive environment in cultivating skills for thriving career in emerging technologies and for pursuing higher studies.

PSO2. Comprehend, explore and build up computer programs in the application domains of Artificial Intelligence & Machine Learning, Data Science and Big Data Analytics and software development in Full Stack for building efficient computer-based systems of varying complexity.

End